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GEOGRAPHIC MEMORANDUM

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GEOGRAPHIC ANALYSIS OF THE NORTHERN URALS REGION

CIA/RR-G/I-270

October 1958

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

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GEOGRAPHIC MEMORANDUM

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CENTRAL INTELLIGENCE AGENCY

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The Northern Urals Region

The Northern Urals Region* consists of a sparsely populated Arctic and Subarctic plain that is divided into two parts by the Ural Range. It is one of the few parts of the Soviet Arctic that is linked by year-round rail transportation with the rest of the USSR. Although terrain and climatic conditions are generally severe, sheltered valleys within the mountains do provide sites where important activities could be carried on throughout the year. With the increase tempo of scientific and economic development in the Arctic during the last two decades, the Northern Urals Region, along with other far northern regions, has become significant because of its potential for highly specialized activities.

* For the purposes of this report, the Northern Urals Region is considered to include the area bounded by the parallels of 64°N and 70°N, and the meridians of 55°E and 70°E.

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Topography

The Northern Urals Region includes the two northern sectors of the Ural Mountain Range -- the Pripolyarnyy (Subarctic) Ural Range and the Polyarnyy (Arctic) -- the extensive plains on either side, and the Pay-Khoy Range to the northwest. Pripolyarnyy Ural refers to that part of the Ural Range between 64°N and 65°30'N. Polyarnyy Ural extends northward from the Pripolyarnyy Ural to approximately 68°30'N. The plain to the west of the mountains consists of the upper basin of the Usa River and the basins of several smaller streams that flow directly into the Arctic Ocean. The plain to the east includes a large part of the lower basin of the Ob' River. Although separated from the northern end of the Urals by 25 miles of tundra, the Pay-Khoy is geologically an integral part of the range.

The Pripolyarnyy Ural is relatively wide, 60 to 95 miles, and has a complex relief pattern. In the southern part, mountain outliers and foothills reach out in all directions from the central mountain core. In the north, the Pripolyarnyy Ural becomes a series of parallel ridges with peaks rising to maximum elevations of 5,600 and 5,900 feet, the highest elevations in the entire Ural Range. Characteristic features of the Pripolyarnyy Ural are its sharp peaks and wide, steep-walled glacial valleys. At the heads of most of the valleys, there are deep cirque basins. In places the valley floors are blocked by morainic deposits composed of clay, sand, gravel, and boulders. The eastern and western slopes of the Pripolyarnyy Ural differ greatly, a characteristic common to all of the Urals. On the west the slopes are generally gentle, whereas on the east the mountains drop abruptly to the West Siberian Plain.

The Polyarnyy Ural Range is considerably narrower than the Pripolyarnyy Ural -- in many places only 25 miles in width and rarely more than 45 miles. The Polyarnyy Ural Range terminates abruptly in the north at Gora Konstantinov-Kamen', which has an elevation of 1,493 feet. Throughout the southern two-thirds of its length, the Polyarnyy Ural Range is a single linear range. North of the Yelets-Sob' Valleys, however, a second range parallels the main ridge on the west.

At elevations of approximately 2,000 to 2,600 feet, the Polyarnyy Ural Range has a plateau-like surface. Above the plateau, individual peaks

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rise to heights of 3,600 or 4,300 feet; and the tallest, Gora Pay-Yer reaches 4,921 feet. Although some of the peaks are rugged, others are rounded in form. On both sides the mountains are dissected by deep valleys whose headward sections in many instances approach each other so closely that together they form excellent natural corridors across the mountains. The Kara-Shchuch'ya and the Yelets-Sob' Valleys are the two most notable examples of such natural corridors. The latter corridor forms the route of the railroad from Seyda to Salekhard.

The plain to the west of the Ural Range, comprising the eastern part of the Bol'shezemel'skaya Tundra, has level to rolling terrain. Elevations increase gradually southward from the coastline to the interior, where rounded hills reach absolute elevations of 650 to 1,000 feet and then drop again to about 330 feet along the tributary valleys of the Usa River. The highest elevation, at a point roughly 10 miles northwest of Khal'meryu, is about 1,410 feet. The hills are composed of complex mixtures of clay, sand, gravel, and boulders. Between the hills, streams twist and turn haphazardly. Because of the low rate of evaporation and the poor drainage, the surface of the western plain is dotted with bogs and small lakes of various shapes.

The sparsely inhabited plain east of the Ural Range is a part of the West Siberian Plain. For the most part, it is a flat, almost featureless expanse that rises slowly southward from the coast. Elevations rarely exceed 500 feet except in the slightly rolling country between the Ural Range and the Ob' River, where occasional heights exceed 650 feet. Because of the almost imperceptible slope, drainage is extremely poor, bogs are widespread, and lakes are fairly abundant. The streams form a dense dendritic pattern dominated by the Ob' River, with its elaborate network of braided channels. During the ice breakup in late May or early June, the Ob' may rise as much as 40 feet and flood areas up to 30 miles in width.

The Pay-Khoy Range is not a continuous ridge, but rather a series of small, isolated ranges and hills that stretch from southeast to northwest and attain elevations of 650 to 1,300 feet. Actually these hills rise only 330 to 500 feet above the surrounding elevated undulating plain of

the inner part of the Yugor Peninsula. Surrounding the range on the west, north, and northeast is the lowland coast of the peninsula. On the southeast the Pay-Khoy is separated from the Urals by a lowland, through which the Kara River flows. The Pay-Khoy ridge is composed of crystalline shists and sedimentary strata.

Soils

The major part of the Northern Urals Region is covered by tundra gley soils, which are found on the plains area on both sides of the Ural Mountains north of 67°N. These soils, consisting of a sparse peaty-humus horizon underlain by a moist and poorly aerated gley horizon*, are structurally very poor. On the western side of the Urals the gley soils are interspersed with sizable areas of light soils and sandy loams. Smaller areas of swamp soils are also found in the area north of 67°N, primarily along the coast and in a band extending from the southern tip of Baydaratskaya Guba south ward to the south of the Ob' River. The piedmont sections of the Urals are covered by acidy non-podzolized soils, and the mountains themselves by mountain-tundra soils.

In the Northern Ural Region south of 67°N the predominant soil types are gley-podzolic and podzolic, and alluvial-humus soils, with a few small patches of podzolic-swamp soils. The entire Ob' flood plain is covered by alluvial soils.

Representative Soil Profile for the Northern Ural Region

Horizon	Depth in inches	Characteristics
A	16 - 24	Poorly decomposed turf, dry or slightly moist, brown in color, friable.
AB	24 - 100	Grey-brown powdery sandy loam, moderately moist or moist.
C	100 - 400 and deeper	Brown light loam, sometimes sandy or sand with pebbles, moist, with gleized areas.

Permafrost lowers the soil temperatures, thus reducing the rate of decomposition and soil formation, and prevents the percolation of surface waters to any appreciable depth.

The Northern Urals Region lies within the zone of discontinuous permafrost. The depth of annual melting of permafrost has a significant influence on the composition and structure of both soil and rock. Peaty and peaty-gley soils thaw to a depth of only 8 to 16 inches; clayey soils to a depth of 32 to 48 inches; and sandy soils to an average depth of 60 to 64 inches.

* A soil horizon in which the material ordinarily is bluish gray or olive gray, more or less sticky, compact, and often structureless, is called a gley horizon. It is developed under the influence of excessive moisture.

In the Vorkuta area the depth of permafrost during the summer thawing varies from place to place. In the driest spots, which are covered by a layer of peaty turf, permafrost is found at a depth of 12 to 20 inches; in moist depressions at a depth of 26 inches; and in denuded spots with sticky, heavy clay at a depth of 40 inches.

The thickness of permafrost also varies considerably from place to place; but it generally decreases in thickness from north to south. Test borings at Anderma indicate that permafrost extends to a depth of 752 feet. West of Vorkuta in the Bol'shezemel'skaya Tundra, the permafrost is reported to be 100 feet thick.

NORTHERN URAL REGION

SOILS

Arctic desert and tundra

Tundra-gley

Gley-podzolic and podzolic, alluvial-humus

Mountain forest podzolic and acid non-podzolic

Mountain tundra

Podzolic-swampy

Swampy

Alluvial

Vegetation

The vegetative pattern of the Northern Urals Region is characterized by latitudinal zonation, interrupted only by the Ural Mountains. The region includes both tundra and taiga vegetation. Beginning in the north, the tundra zone is divided into the following subzones: The Arctic tundra, the lichen-moss tundra, the bushy and hillocky tundra, and the wooded tundra. Arctic tundra is found on the island of Vaygach and on the adjacent parts of the Yugor Peninsula, where it extends to the vicinity of Amderma. In the Arctic tundra, vegetation is extremely scant. Trees are completely lacking, and shrubs grow only rarely along stream courses and in places especially sheltered from strong winds. Sedges and short grasses are widespread. Sphagnum peat bogs are lacking.

The lichen-moss tundra extends southward from the Arctic tundra to about 69°N. Lichen and moss are the predominant vegetative types. Although the tundra is without trees, shrub thickets of dwarf birches and willows and ledum grow along the river courses and in sheltered areas between rivers. In the north shrub thickets are relatively rare, but they become denser and more numerous to the south. Some sphagnum peat bogs consisting of layers of sphagnum moss occur, but they are not widespread. Sedges and short grasses are also characteristic of this subzone.

The bushy and hillocky tundra extends southward from the lichen-moss tundra to about 67°N. In this subzone, forests occur but only along the stream courses. On the interfluves, shrub thickets, sedges, and short grasses predominate. Sphagnum peat bogs are numerous.

South of the bushy and hillocky tundra to about 66°N is the wooded tundra, which is a transitional zone between the true tundra and the taiga. Here forests are found not only along the rivers, but also in patches on the interfluves. Among the types of tundra vegetation represented are thickets of shrub birches and willows, sedges, and grasses. Patches of "spotty tundra" occur throughout the wooded tundra, and sphagnum peat bogs cover about half of the total area. The Pripolyarnyy and Polyarnyy Ural Ranges protrude northward from the taiga into the tundra. Because of elevation, the vegetation in these ranges above 2,000 feet is mainly tundra.

Subalpine species such as dwarf Arctic birch, mosses, lichens, and short grasses predominate.

South of the wooded tundra is the taiga, characterized by coniferous forests interspersed with peat bogs and swamps. The forests along the northern border of the taiga zone consist of stunted trees growing in sparse stands. Southward to about 65°N, swampy stands of spruce and larch predominate, with an admixture of Siberian stone pine and birch. Extensive areas are in swamp. Farther south, in the subzone of northern coniferous-forests, Siberian stone pine predominate, but there are also stands of larch, spruce, and pine. Interspersed throughout the forest are extensive areas covered by peat bogs.

Along the lower flanks of the Pripolyarnyy and Polyarnyy Ranges to an elevation of about 1,300 feet are extensive but somewhat sparse stands of spruce and fir. Other species include Siberian stone pine and birch. Above this zone to about 2,000 feet is the meadow-forest zone. Here birch grows with admixtures of fir, spruce, or in a few places Siberian larch alternate with small glades. The floodplain of the Ob' River is covered by meadows, brush, and forests.

NORTHERN URAL REGION

VEGETATION

- Arctic tundra
- Lichen-moss tundra
- Bushy and hillocky tundra
- Wooded tundra
- Sparse subalpine bushes
- Sparse, swampy stands of spruce and larch
- Coniferous forest
- Meadow, bush, and forest vegetation on floodplains
- Mountain forests of spruce and fir.

Water Supply

Because of the many rivers, streams, and lakes, the water supply of the Northern Ural Region is abundant in summer, but the supply becomes meager in winter when the surface water freezes. The Ob' River, however, has a large enough flow to meet all water requirements the year around. Meager to moderate amounts of ground water can also be found at shallow depths (0 to 100 feet), chiefly in the alluvial soils along river courses. In the Polyarnyy Ural Range, however, the ground water supply is extremely poor. The major sources of water supply in the Northern Ural Region are the Ob' River system east of the Urals and the Usa River system to the west. The drainage basins of these two rivers are separated by the crest of the Northern Urals. The headwater sections of all tributaries that rise on the flanks of the Urals are characterized by narrow, steep valleys, numerous rapids, and a rapid flow. In the lowland areas, however, the currents become very slow and the rivers have broad, shallow channels. Little specific hydrological data is available for the Northern Ural Region, being limited to a few stations on the Ob', Poluy, and Usa Rivers.

Salekhard is the only point on the Ob' and Poluy Rivers for which hydrologic data are available. Average annual flow of the Ob' River at Salekhard (66°38'N-66°34'E) is at the rate of 11,900 cubic meters per second. The average dates of freezing and break-up of ice on the Ob' River are 26 October and 1 June, respectively; the river remains frozen for over 7 months a year. Ice on the Ob' River freezes to an average depth of 99 centimeters at the latitude of Berezovo (63°55'N-65°05'E) and 148 centimeters at Salekhard, the river ice becoming progressively thicker from October until the break-up of ice. The greatest river flow coincides with the break-up of ice in late May or early June; the minimum flow occurs during March and April, just before the thaw sets in. The average dates of freezing and break-up of ice on the Poluy River at Salekhard are 13 October and 26 May, respectively; the river remains frozen for about 7 1/2 months a year.

West of the Urals, the major water supply is the Usa River, which has an average annual flow of 496 cubic meters per second at Petrun' (66°26'N-60°48'E). The absolute minimum flow at this point is 6.3 cubic

meters per second, which occurs in winter; and absolute maximum flow is 9,610 cubic meters per second, which accompanies the break-up of ice in spring. The Una River may freeze as early as 10 October or as late as 18 November, but the average date is 24 October. The river ice breaks up sometime between 21 April and 8 June, with the average date being 23 May. The duration of ice cover averages about 7 months, but in severe winters the ice cover may remain as long as 8 months. Ice on the Una River has reached a thickness of 135 centimeters by the end of April. The speed of the current ranges from 0.28 to 0.64 meters per second at Yenyenan (65°30'N-62°58'E) and from 0.24 to 0.67 meters per second at Yakrun (65°33'N-60°08'E).

Climate

The climate of the Northern Ural Region is characterized by long, cold winters; short, cool summers; and sudden changes from cold spells to thaws. In winter the air temperature falls to 40 to 50 degrees below zero Centigrade (-40° to -58° F.), and in the summer the temperature is cool, with July averages ranging from 16 degrees Centigrade (60.8° F.) in the southern part of the area to 6 degrees Centigrade (42.2° F.) in the north. Precipitation increases with elevation in the Urals, the greatest rainfall and the deepest snow cover occurring on the western slopes of the mountains. The duration of the snow cover varies in length from about 220 days in the south to about 260 days in the north. In the northern Urals snow begins to fall in September and deep snow cover accumulates during the winter. In the spring, heavy thaws are accompanied by floods. Relative humidity and cloudiness are greater to the west of the Urals than to the east. High winds are common in the coastal tundra area in autumn and winter, and frequently accompany snowstorms. Winds of gale force (32 m.p.h.) occur on an average of 52 days a year at Salekhard, most commonly during the period from March through June. The predominant winds are from north and northwest in July and from the south and southeast in January.

Detailed climatic data are presented in the following tables for 4 stations within or near the Northern Ural Region -- Yugorskiy Shar (69°49'N-60°45'E), Mare-Sale (69°43'N-66°48'E), Salekhard (66°31'N-66°35'E), and Berezovo (63°56'N-65°04'E). Limited information on temperature and precipitation is also presented for Petrun' (66°28'N-60°35'E).

Although no climatic data are available for Polyarnyy Ural (67°00'N-65°05'E), its climate is probably only slightly more severe than that of Salekhard, since it is located about 55 miles to the northwest at an elevation of about 650 feet. Polyarnyy Ural, however, will have slightly more precipitation, deeper snow cover, and lower air temperatures than Salekhard. Winds predominantly from the northeast or southwest can be expected; velocities will be relatively high, and will cause severe snow drifting during the winter.

Climate of the Northern Ural Region

Table 1

Air Temperatures (in °C)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly	Max*	Min*
Yugorskiy Shar	Mean	-14.9	-17.7	-18.3	-11.2	-4.5	1.5	6.6	7.2	4.2	-1.9	-6.6	-13.4	-5.8	25.6	-44.1
	Mean Maximum	-11.1	-14.1	-14.4	-7.4	-2.2	4.0	10.3	10.1	6.1	0.2	-4.0	-10.1	-2.7		
	Mean Minimum	-18.9	-22.3	-23.0	-15.7	-7.4	-0.6	2.9	4.0	1.7	-4.8	-9.7	-18.0	-9.3		
Mare-Sale	Mean	-18.3	-20.1	-20.7	-12.4	-5.2	1.5	6.2	6.4	3.7	-3.5	-10.2	-17.4	-7.5	26.5	-50.2
	Mean Maximum	-13.6	-15.6	-16.6	-8.3	-2.5	4.2	10.5	9.6	5.6	-1.1	-6.7	-13.4	-4.0		
	Mean Minimum	-22.6	-23.8	-24.9	-16.9	-7.9	-0.8	3.0	3.8	1.5	-6.4	-14.2	-21.4	-10.9		
Salekhard	Mean	-25.6	-21.8	-18.0	-10.5	-2.2	7.1	13.8	11.1	5.1	-4.9	-16.7	-21.9	-7.0		-53.9
	Mean Minimum	-29.4	-27.8	-22.2	-15.0	-5.6	3.3	9.5	7.8	2.8	-6.7	-20.6	-27.2	-11.1		
Berezovo	Mean	-23.6	-18.4	-12.9	-5.3	2.5	10.3	15.7	13.0	6.2	-3.4	-14.6	-20.5	-4.2		-49.4
	Mean Minimum	-27.2	-24.4	-19.4	-10.0	-1.7	6.7	11.7	8.9	2.8	-5.6	-17.8	-26.1	-7.7		
Petrun'	Mean	-21.1	-19.7	-16.0	-7.3	20.3	7.4	14.4	11.1	5.6	-3.7	-13.3	-16.8	-4.9		

*Absolute values

Table 2

Mean Precipitation (in mm.)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
Yugorskiy Shar	4	4	4	5	11	23	28	44	44	24	9	9	209
Mare-Sale	6	5	4	5	10	24	26	43	39	22	8	5	197
Salekhard	8	8	8	8	20	36	59	57	42	15	13	13	287
Berezovo	17	10	16	16	41	60	63	61	43	23	21	17	388
Petrum'	17	13	14	16	30	41	60	54	48	32	22	18	365

Table 3

Mean Depth of Snow Cover for 10-Day Periods (in cm.)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
Yugorskiy Shar	18; 19; 20	20; 21; 22	25; 27; 30	33; 33; 34	32; 32; 24	12; 0; 0	---	---	---	2; 1; 2	4; 9; 10	13; 14; 16	
Mare-Sale	13; 14; 14	13; 12; 12	11; 11; 12	12; 12; 11	10; 10; 6	2; 1; 0	---	---	---	0; 1; 3	9; 11; 10	9; 9; 10	
Salekhard	49; 52; 56	60; 61; 63	64; 64; 65	64; 64; 48	24; 19; 6	---	---	---	---	2; 6; 8	15; 25; 33	39; 43; 45	
Berezovo	39; 44; 49	50; 51; 57	60; 64; 68	65; 54; 30	6 0 0	---	---	---	---	3; 1; 5	8; 16; 26	32; 38; 38	

Table 4

Mean Number of Days with Gales (32 m.p.h.)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
Mare-Sale	10	10	10	8	8	4	3	4	7	10	11	11	96
Salekhard	3	4	6	5	6	7	4	4	5	5	4	5	58
Berezovo	*	2	3	2	2	2	2	1	2	1	2	1	20

*Less than 0.5 day

Table 5

Average Wind Speed (meters per sec.)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
Yugorskiy Shar	7.9	8.0	7.2	7.3	6.9	614	5.5	5.5	6.9	7.4	8.6	8.2	7.2
Mare-Sale	7.6	8.1	7.1	7.3	7.3	6.5	5.4	6.0	7.3	7.8	8.5	7.5	7.2

Table 6

Prevailing Wind Directions

Station	Winter	Spring	Summer	Autumn
Yugorskiy Shar	E	N	N	NE
Mare-Sale	SE	SW	NW	W
Salekhard	S	SW and NE	NE	SW
Berezovo	S	S	N	S

Economy

The major economic activities of the Northern Ural Region are mining, fishing, and to a lesser degree reindeer herding. Mining, the most important activity, is concentrated west of the Ural Range in the upper Pechora River Basin, where the vast reserves of bituminous coal yielded 15 million tons in 1956. In addition to supplying the local demands of the Region, Pechora coal is exported by rail and water to the industrial area of Leningrad and to the Arctic ports of Murmansk and Arkhangel'sk.

Mining settlements have been established near many of the coal deposits. Of these the most important is Vorkuta, which accounted for nearly three-fourths of the Pechora production in 1956. Vorkuta, which was formerly a forced-labor settlement, now has a population consisting mostly of contract and volunteer workers. With an estimated population of 60,000, it is currently the largest city in the Northern Ural Region and the site of a number of industries, cultural and educational facilities, and Arctic research stations. The second largest producing center is Inta near the southern limit of the coal basin. In 1956, Inta accounted for 4 million tons of coal or about one-fourth of the basin's output.

Other mineral deposits are also located within the region -- lead-zinc at Varnek on Ostrov Vaygach, fluorite at Amderma on the Kara Sea Coast, and undoubtedly others throughout the region -- but there is no indication that any of these deposits are currently being exploited. The mines at Amderma, formerly an important source of fluorite, have reportedly been closed in favor of more accessible deposits. The construction of a proposed railroad from Vorkuta to Amderma via Kara would presumably reactivate the exploitation of these deposits. At present, Amderma has a population estimated at more than 10,000 and is the site of a major polar station, an airfield, and a radio center. West of Amderma along the southern shore at Proliv Yugorskiy Shar is the small Northern Sea Route port of Khabarovo.

Fishing is an important activity along the Ob' River and its estuary and in the Arctic waters to the north. The Ob' estuary, supplying large quantities of salmon, sturgeon, and whitefish, is the second most important fishing area in the Soviet Arctic. Small fishing ports, canneries, and motorized fishing stations are scattered along the river and the shores of the estuary.

Fishing, primarily for local consumption, is also of some significance in the Usa and Vorkuta Rivers, tributaries of the Pechora.

The largest processor of fish products in the Northern Ural Region is the Salekhard Canning Combine, which includes plants at Kushevat, Shugin, Puyko, and Aksarka. Products of the canneries are shipped by water and rail to markets throughout the country. Among the other industries of Salekhard are sawmilling and boat-repairing. The location of the present railhead at Labytnangi on the bank of the Ob' opposite Salekhard and the construction of the Salekhard-Igarka railroad in the early 1950's contributed to the growth and importance of Salekhard as a supply and shipping center on the lower Ob' River. Educational, cultural, and medical facilities as well as a number of scientific research stations in support of the local economy are located within the city. Salekhard is also the administrative center of the Yamalo-Nenetskiy Natsional'nyy Okrug. The city has a population of 16,000 (1956) consisting mainly of Russians.

Reindeer herding on a collectivized scale is conducted throughout most of the Northern Ural Region, notably in the Arctic tundra and to a lesser extent in the forests to the south. Herding as the principal occupation of the indigenous population, which consists mainly of Nentsy, with smaller numbers of Komi and Khanty. A significant feature of the herding economy is the seasonal migration of the reindeer. During the winter the herds feed in the wooded tundra and northern forests, which provide shelter from the biting winds. With the advent of warmer weather and melting snow, the herds are driven northward as far as the Arctic coasts and into the alpine regions of the Polyarnyy Ural Range to graze and to escape swarms of mosquitoes and biting flies. In a number of the larger settlements, permanent collective farms have been established to supervise the breeding and herding of reindeer. Although the individual herders are allowed to own a limited number of reindeer, they find it necessary to supplement their meager livelihood by hunting, trapping, and fishing.

RECOMMENDED MAP COVERAGE

1. Tyumenskaya Oblast'; 1:2,000,000; Glavnoye Upravleniye Geodezii i Kartografii MVD SSSR; 1957; Moscow; a territorial administrative map.

2. Arkhangel'skaya Oblast'; 1:1,500,000; Glavnoye Upravleniye Geodezii i Kartografii MVD SSSR; 1957; Moscow; a territorial administrative map.

3. Gipsometricheskaya Karta SSSR (The Hypsometric Map of the U.S.S.R.); 1:2,500,000; Glavnoye Upravleniye Geodezii i Kartografii Pri Sovete Ministrov SSSR; 1949; Moscow.

4. Ural i Priural'ye; 1:1,500,000; Glavnoye Upravleniye Geodezii i Kartografii Pri Sovete Ministrov SSSR; 1952; Moscow; a physical map.

5. Geologicheskaya Karta SSSR (The Geological Map of the U.S.S.R.); 1:2,500,000; The Ministry of Geology of the U.S.S.R.; 1956.

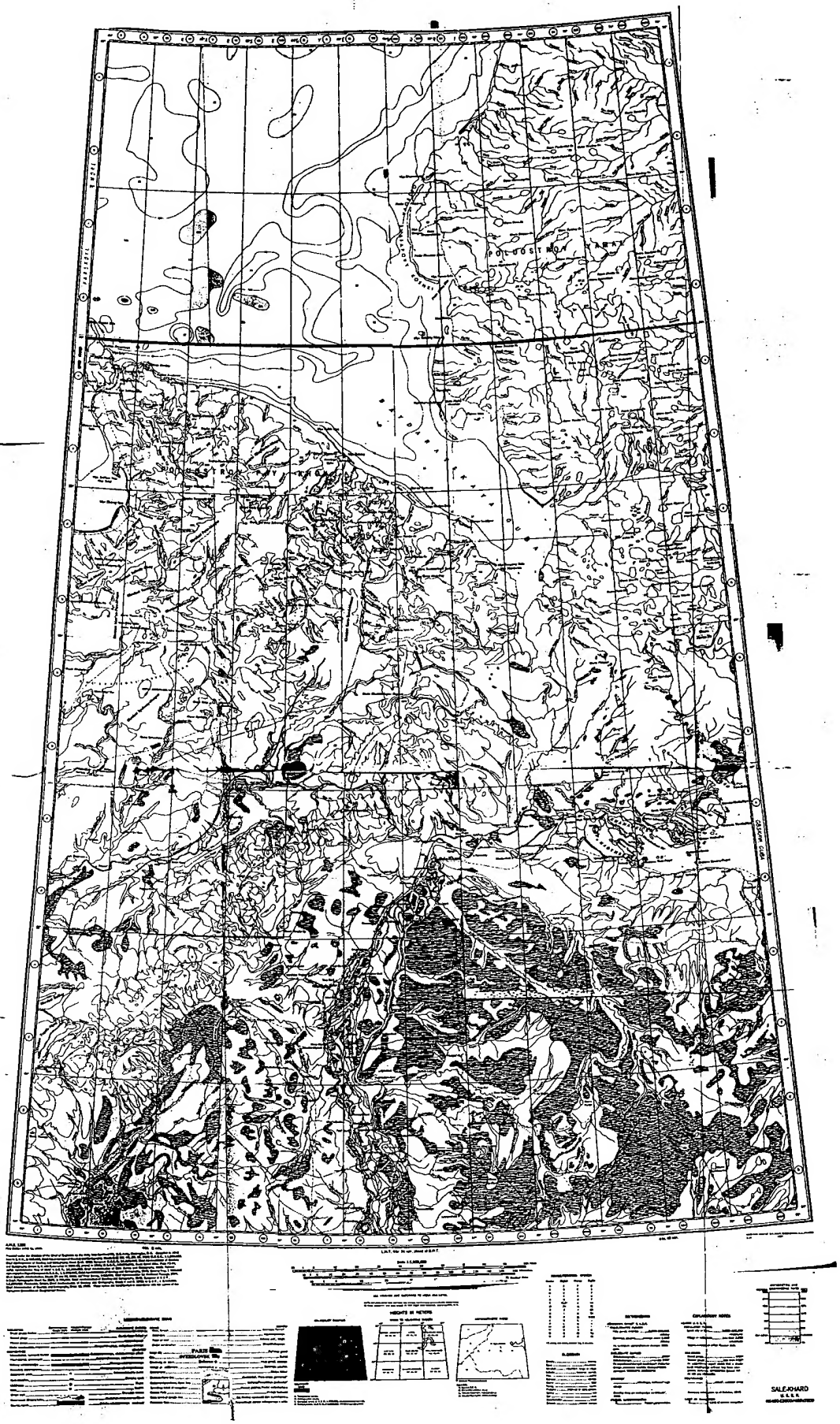
6. Geologicheskaya Karta Sovetskoy Arktiki (The Geological Map of the Soviet Artic); 1:2,500,000; Ministerstvo Geologii i Okhrany Nedr SSSR; 1957.

7. Pochvennaya Karta SSSR (The Soil Map of the U.S.S.R.); 1:4,000,000; Glavnoye Upravleniye Geodezii i Kartografii MVD SSSR; 1955; Moscow.

8. Karta Rastitel'nosti SSSR (The Vegetative Map of the U.S.S.R.); 1:4,000,000; Glavnoye Upravleniye Geodezii i Kartografii MVD SSSR; 1955; Moscow.

9. Karta Lesov SSSR (The Forest Map of the U.S.S.R.); 1:2,500,000; Glavnoye Upravleniye Geodezii i Kartografii MVD SSSR; 1955; Moscow.

10. Giorokhimicheskaya Karta SSSR: Podzemnyye Vody (The Hydrochemical Map of the U.S.S.R.: Ground Water); 1:5,000,000; Ministerstvo Geologii i Okhrany Nedr SSSR; 1956.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